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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,012	07/30/2003	Takahisa Shiozawa	1232-5092	8529
27123	7590	08/05/2004	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 345 PARK AVENUE NEW YORK, NY 10154			FULLER, RODNEY EVAN	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,012

Applicant(s)

SHIOZAWA, TAKAHISA

Examiner

Rodney E Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

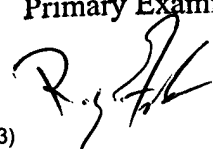
- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Rodney Fuller
Primary Examiner

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/28/03.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanitsu, et al. (US 2002/0085276).

Regarding claims 1, 10 and 12, Tanitsu discloses “an illumination-light generating mechanism (paragraph 0095, line 2) for dividing the light and for forming a quadrupole (paragraph 0095, line 5) light intensity distribution around an optical axis on a surface that has substantially a Fourier conversion relationship with the mask, so as to resolve the predetermined pattern and restrain the auxiliary pattern from resolving, wherein at least one of a size of each pole of the quadrupole light intensity distribution and a distance between the optical axis and each pole of the quadrupole light intensity distribution are variable (paragraph 0238, lines 6-13).”

Regarding claim 2, Tanitsu discloses “wherein said illumination-light generating mechanism includes a prism (Fig. 1, ref.# 10).”

Regarding claim 3, Tanitsu discloses “wherein the prism includes pyramid surfaces that arrange a concave surface at an incident surface side and a convex surface at an exit surface side.” (paragraph 0014, lines 13-24)

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Regarding claim 4, Tanitsu discloses “wherein the illumination-light generating mechanism includes a diffraction optical element.” (paragraph 0021, lines 8-12)

Regarding claim 5, Tanitsu discloses “wherein the illumination-light generating mechanism includes: plural optical elements (Fig. 1, ref.# 4, 5, 6, 7); and a switch mechanism (Fig. 1, ref.# 22) for arranging each optical element on and retreating each optical element from a light path (Fig. 1, ref.# AX).”

Regarding claim 6, Tanitsu discloses “an illumination-light deforming mechanism for varying at least one of a size of each pole of the quadrupole light intensity distribution (paragraph 0238, lines 6-13) and a distance between the optical axis and each pole of the quadrupole light intensity distribution, wherein the illumination-light deforming mechanism includes plural lenses that have a variable magnification or focal distance (paragraph 0012, lines 12-17).”

Regarding claim 7, Tanitsu discloses “an illumination-light deforming mechanism for varying at least one of a size of each pole of the quadrupole light intensity distribution (paragraph 0238, lines 6-13) and a distance between the optical axis and each pole of the quadrupole light intensity distribution, wherein the illumination-light deforming mechanism includes: first and second optical members (Fig. 1, ref.# 5, 7); and a drive mechanism (Fig. 1, ref.# 23, 24, 25) for relatively moving the first and second optical members in an optical-axis direction.”

Regarding claim 8, Tanitsu discloses “wherein each of the first and second optical members is a prism (Fig. 1, ref.# 10a, 10b).”

Regarding claim 9, Tanitsu discloses “wherein each pole of the quadrupole light intensity distribution has a variable shape.” (paragraph 0021, lines 3-8)

Regarding claims 10-13 Tanitsu discloses “an illumination optical system (Fig. 1, ref.# 2-10) for illuminating a mask (Fig. 1, ref.# M) using light from a light source (Fig. 1, ref.# 1), said mask arranging a predetermined pattern and an auxiliary pattern smaller than the predetermined pattern; and a projection optical system (Fig. 1, ref.# PL) for projecting light from said illumination optical system onto an object (Fig. 1, ref.# W) to be exposed.”

Regarding claims 11 and 13, Tanitsu discloses “wherein said illumination optical system includes an illumination-light generating mechanism (paragraph 0095, line 2) for dividing the light and for forming a quadrupole light intensity distribution (paragraph 0095, line 5) around an optical axis on a predetermined surface that has substantially a Fourier conversion relationship with the mask, so as to resolve the predetermined pattern and restrain the auxiliary pattern from resolving, wherein a distance between barycenters of two facing poles of the quadrupole light intensity distribution is variable between 0.32 and 0.90 where a diameter of the pupil in the projection optical system is assumed to be 1.” (paragraph 0238, lines 6-13)

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Shiraishi, et al. (US 5,719,704), Wangler, et al. (US 5,675,401), Tanitsu (US 6,236,449), Schultz, et al. (US 6,295,122), Mizouchi (US 6,259,512), Wangler, et al. (US 6,285,443) and Mulkens, et al. (US 6,452,662) each disclose an illumination optical system with an

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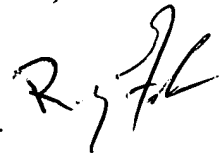
generating mechanism for forming a quadrupole light intensity distribution around an optical axis.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney E Fuller whose telephone number is 571-272-2118. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rodney E Fuller
Primary Examiner
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July 29, 2004